

WHAT IS CLAIMED IS:

1. A method, comprising:
 - receiving a packet;
 - determining an address of a free entry in a queue;
 - placing the determined address in an entry of a prior-determined address in the queue to form a linking list; and
 - placing packet data of the packet in a free entry of a first data structure,wherein there is one-to-one mapping between the queue and the first data structure.
2. The method of claim 1, wherein the packet is unicast.
3. The method of claim 1, wherein the packet is multicast or broadcast, and further comprising:
 - determining an address of a free entry in each queue associated with a destination in the packet; and
 - for each queue associated with a destination in the packet, placing the respective determined address in a respective entry of a prior-determined address in each respective queue.
4. The method of claim 1, further comprising:
 - determining a priority level for the received packet; and
 - wherein the placing the determined address places the determined address in an entry of a prior-determined address in the queue having the same priority.
5. The method of claim 4, wherein the determining a priority level includes examining a quality of service field within the received packet.
6. The method of claim 1, further comprising updating free entry data to indicate that the determined address is in use.
7. The method of claim 1, further comprising placing a packet length of the packet in a free entry of a second data structure; and wherein there is one-to-one mapping between the first data structure and the second data structure.
8. A transmit queue system, comprising:

means for receiving a packet;
 means for determining an address of a free entry in a queue;
 means for placing the determined address in an entry of a prior-determined address in the queue to form a linking list; and
 means for placing packet data of the packet in a free entry of a first data structure,
 wherein there is one-to-one mapping between the queue and the first data structure.

9. A transmit queue system, comprising:
 a first data structure capable of holding a plurality of packet data;
 a queue capable of holding a linking list of addresses, the addresses having a one-to-one mapping with addresses in the first data structure;
 a packet receiving engine capable of receiving a packet;
 a free entry engine coupled to the packet receiving engine and capable of determining an address of a free entry in the queue;
 a transmit queue engine, coupled to the queue, the packet receiving engine and the free entry engine, capable of placing the determined address in an entry of a prior-determined address in the queue to form a linking list;
 and
 a packet buffer engine, coupled to the first data structure, the packet receiving engine and the free entry engine, capable of placing packet data of the packet in a free entry of the first data structure.

10. A method, comprising:
 receiving an address in a queue;
 reading packet data from an entry from a first data structure with the same address as the received address, the queue and the first data structure having one-to-one mapping;
 transmitting the packet data to a network node associated with the queue;
 reading a next address in the queue from the received address in the queue; and
 using the next address to repeat the reading packet data and the

transmitting.

11. The method of claim 10, further comprising reading packet length from a second data structure, the second data structure having one-to-one mapping with the first data structure.

12. The method of claim 10, wherein the receiving receives an address for higher priority packet data before receiving an address for lower priority packet data.

13. The method of claim 10, wherein the packet data is multicast or broadcast and the transmitting transmits the packet data to a plurality of network nodes.

14. The method of claim 10, wherein the packet data is unicast.

15. The method of claim 10, further comprising updating free entry data to indicate an address is free after the transmitting.

16. A transmit queue system, comprising:

means for receiving an address in a queue;

means for reading packet data from an entry from a first data structure with the same address as the received address, the queue and the first data structure having one-to-one mapping;

means for transmitting the packet data to a network node associated with the queue;

means for reading a next address in the queue from the received address in the queue; and

means for using the next address to rerun the means for reading packet data and the means for transmitting.

17. A transmit queue system, comprising:

a first data structure holding a plurality of packet data;

a queue holding a linking list of addresses, the addresses having a one-to-one mapping with addresses in the first data structure; and

a packet transmit engine, coupled to the first data structure and the queue, capable of

receiving an address in the queue,

reading packet data from an entry from the first data

structure with the same address as the received address, transmitting the packet data to a network node associated with the queue,
reading a next address in the queue from the received address in the queue, and
using the next address to repeat the reading packet data and the transmitting.